OPERATING INSTRUCTIONS AND OWNER'S MANUAL

MR. HEATER

MODEL: 3500DF 4000DF 6000DF

READ INSTRUCTIONS CAREFULLY: Read and follow all instructions. Place instructions in a safe place for future reference. Do not allow anyone who has not read these instructions to assemble, light, adjust or operate the heater.

HEATSTAR BY ENERCO

MODEL: 3500DF 4000DF 6000DF

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828-670-1970
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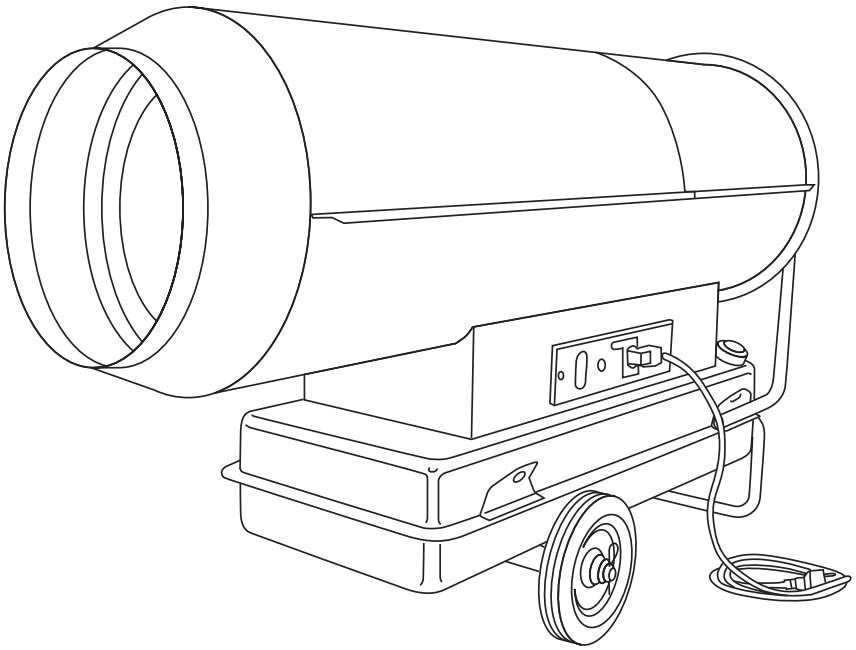


DIRECT FIRED PORTABLE HEATER

WARNING: **If the information in this manual is not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.**

— Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.
— Service must be performed by a qualified service agency.

This is an unvented portable heater. It uses air (oxygen) from the area in which it is used. Adequate combustion and ventilation air must be provided. Refer to page 5.

WARNING:

⚠ YOUR SAFETY IS IMPORTANT TO YOU AND TO OTHERS, SO PLEASE READ THESE INSTRUCTIONS BEFORE YOU OPERATE THIS HEATER.

GENERAL HAZARD WARNING:

⚠ FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND/OR ELECTRICAL SHOCK.

⚠ ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THE INSTRUCTIONS SHOULD USE OR SERVICE THIS HEATER.

⚠ IF YOU NEED ASSISTANCE OR HEATER INFORMATION SUCH AS AN INSTRUCTIONS MANUAL, LABELS, ETC. CONTACT THE MANUFACTURER.

WARNING:

⚠ NOT FOR HOME OR RECREATIONAL VEHICLE USE

WARNING:

⚠ FIRE, BURN, INHALATION, AND EXPLOSION HAZARD. KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.

WARNING:

⚠ **The State of California requires the following warning:** COMBUSTION BY-PRODUCTS PRODUCED WHEN USING THIS PRODUCT CONTAIN CARBON MONOXIDE, A CHEMICAL KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS (OR OTHER REPRODUCTIVE HARM).

WARNING:

READ THE INSTRUCTIONS GIVEN IN THIS MANUAL BEFORE USING THE APPLIANCE.

- DO NOT USE GASOLINE, NAPHTHA OR VOLATILE FUELS.
- THE ELECTRICAL SYSTEM TO WHICH THE APPLIANCE IS CONNECTED MUST COMPLY WITH ALL SAFETY REGULATIONS IN FORCE. A RESIDUAL CURRENT CIRCUIT BREAKER MUST BE PROVIDED ON THE MAIN DISTRIBUTION BOARD.
- UNPLUG THE HEATER BEFORE ATTEMPTING ANY SERVICE OR MAINTENANCE.
- ALWAYS CHECK THE POWER SUPPLY CABLE BEFORE USE. IT MUST NOT BE BENT, CRUSHED, OR ANYWAY DAMAGED.
- THE POWER SUPPLY CABLE MUST BE REPLACED ONLY BY QUALIFIED PERSONNEL.
- ONLY USE AN ORIGINAL H07RN-F POWER CABLE WITH WATERPROOF PLUG.
- DO NOT TOUCH THE EXHAUST GAS OUTLET. DANGER OF BURNS!

CONTENTS

WARNINGS 2
SPECIFICATIONS 3
OPERATION 4
SAFETY DEVICES 4
MAINTENANCE 5
TROUBLESHOOTING 6
WIRING DIAGRAMS 7
PARTS LIST 8

IMPORTANT

Before using the heater, read and understand all instructions and follow them carefully. The manufacturer is not responsible for damages to goods or persons due to improper use of units.

GENERAL RECOMMENDATIONS

The direct-fired heater runs on diesel fuel. This direct combustion heater exhausts hot air and the combustion products into the room, while those with indirect combustion are fitted with a flue to take the fumes away through the chimney.

Always follow local ordinances and codes when using this heater:

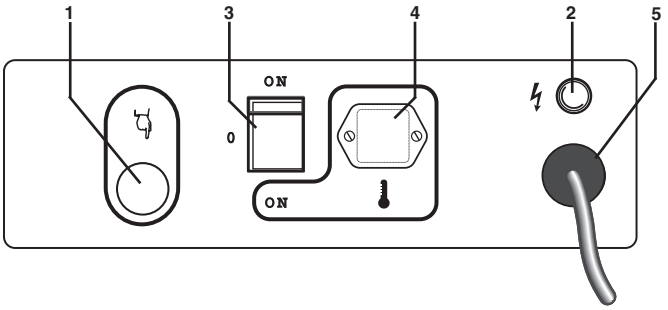
- Read and follow this owner's manual before using the heater.
- Use only in places free of flammable vapors or high dust content.
- Never use heater in immediate proximity of flammable materials (the minimum distance must be 6 ft.).
- Make sure fire fighting equipment is readily available.
- Make sure sufficient fresh outside air is provided according to the heater requirements. Direct combustion heaters should only be used in well vented areas in order to avoid carbon monoxide poisoning.
- Never block air inlet (rear) or air outlet (front).
- In case of very low temperatures add kerosene to the heating oil.
- Make sure heater is always under surveillance and keep children and animals away from it;
- Before starting the heater always check free rotation of ventilator fan.
- Unplug heater when not in use.

TECHNICAL SPECIFICATIONS			MH 3500DF 4000DF HS 3500DF 4000DF	**MH 6000DF HS 6000DF**
Heat input		[kBTU/h]	400	610
Air flow		[cfm]	2.500	2.800
Fuel Type			Diesel/Kerosene/#1-2 Fuel Oil	
Heat output		[kBTU/h]	-	-
Fuel consumption		[gal/h]	12.83	4.46
		[lb/h]	19.58	30.84
Power supply	Phase		1	1
	Voltage	[V]	120	120
	Frequency	[Hz]	60	60
Electric consumption		[W]	1,170	1,040
		[A]	8.30	10.50
Nozzle		[USgal/h]	2.00-30° S	3.00-80°S
Pump pressure		[psi]	174	217
Max static pressure		[in WC]	-	-
Recommended max. temp. in the air duct		[°F]	-	-
Adjustment of combustion air flap		[in]	a=0.59	a=1.00
		N°	-	-
Flue diameter		[in]	-	-
Compulsory flue draft		[in WC]	-	-
Tank capacity		[gal]	27.7	35.7
Dimensions, L x W x H		[in]	62.4x27.6x39	67.9x27.6x41.2
Net Weight		[lb]	222	246

OPERATION

Before any attempt of starting the heater is made, check that your electrical supply conforms to the data on the model plate.

Control Board



1 RESET BUTTON WITH CONTROL LAMP

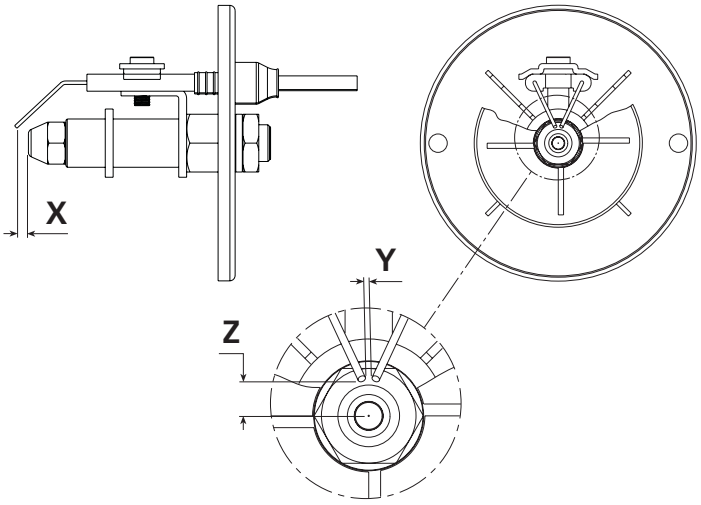
2 CONTROL LAMP

3 MAIN SWITCH

4 ROOM THERMOSTAT PLUG

5 POWER CORD

Gap of Electrodes



Models	X	Y	Z
4000 DF	0.157 in	0.098 in	0.157 in
6000 DF	0.157 in	0.098 in	0.157 in

Clearances

The following minimum safety clearances from materials or objects in the surroundings of the heater must be ensured:

Sides	2.5 ft.	Air Inlet	2.5 ft.
Top	6 ft.	Air outlet	12 ft.

- Floors and ceilings must be made of fireproof materials in the room where the heater is operated.
- The air inlet and outlet must never be blocked for any reason.
- Install the heater on a flat, level floor in a steady position.
- It is forbidden to connect direct-fired heaters to air ducts.

⚠ WARNING

- DO NOT USE GASOLINE, NAPHTHA OR VOLATILE FUELS.
- STOP HEATER BEFORE ADDING FUELS.
- ALWAYS FILL OUTDOORS AWAY FROM OPEN FLAME
- DO NOT USE EXTERNAL FUEL SOURCE.
- DO NOT OPERATE HEATER WHERE FLAMMABLE LIQUIDS OR VAPORS MAY BE PRESENT.
- DO NOT START HEATER WHEN CHAMBER IS HOT
- DO NOT START HEATER WHEN EXCESS FUEL HAS ACCUMULATED IN THE CHAMBER.
- DO NOT PLACE COOKING UTENSILS ON TOP OF THE HEATER.
- PLUG ELECTRICAL CORD INTO A PROPERLY GROUNDED THREE-PRONG RECEPTACLE.

The generator can only work automatically when a control device, such as for example a thermostat or a timer, is connected to the generator. Connection to the generator is made by removing the socket cover(4) and inserting the thermostat plug.

To start the machine you must:

- If connected to the thermostat, turn the switch to (ON + 🌡);
- If not connected to the thermostat, turn the switch to (ON).

When unit is started for the first time or is started after the oil tank has been totally emptied, the flow of oil to the burner may be impaired by air in the circuit. In this case the control box will cut out the heater and it might be necessary to renew the starting procedure once or twice by depressing the reset button (1).

Should the heater not start, check that oil tank is full and depress reset button (1).

Should the heater still not work, please refer to chapter "OBSERVED FAULTS, CAUSES AND REMEDIES".

STOPPING THE HEATER

Set main switch (3) on "0" position or turn thermostat or other control device on lowest setting.

The flame goes out and the fan continues to work for approx. 90sec. cooling the combustion chamber.

SAFETY DEVICES

The unit is fitted with an electronic flame control box. In case of malfunction this box will cut in and stop the heater, at the same time the pilot lamp in the control box reset button (1) will light up.

Heaters are also equipped with an overheat thermostat safety cutout which will stop the heater in case of overheating. This thermostat will reset automatically but you will have to depress button (1) on control box before being able to restart the heater.

TRANSPORT

⚠ WARNING

- Before making any attempt to restart heater find and eliminate reason of overheating.

Before heater is moved it must be stopped and unplugged. Before moving the heater wait till it has totally cooled off and make sure oil tank cap is securely fixed.

The hot air generators with wheels must be wheeled. The suspended version which has no wheels must be transported with adequate machinery.

MAINTENANCE

Preventive and regular maintenance will ensure a long trouble free life to your heater.

⚠ WARNING

- Never service heater while it is plugged in, operating or hot. Severe burns or electrical shock can occur.

Every 50 hours of operation: disassemble filter and wash with clean oil, remove upper body parts and clean inside and ventilator with compressed air, check correct attachment of H.V. connectors to the electrodes and check H.V. cables, remove burner assembly, clean and check electrode settings, adjust according to scheme "GAP OF ELECTRODES".

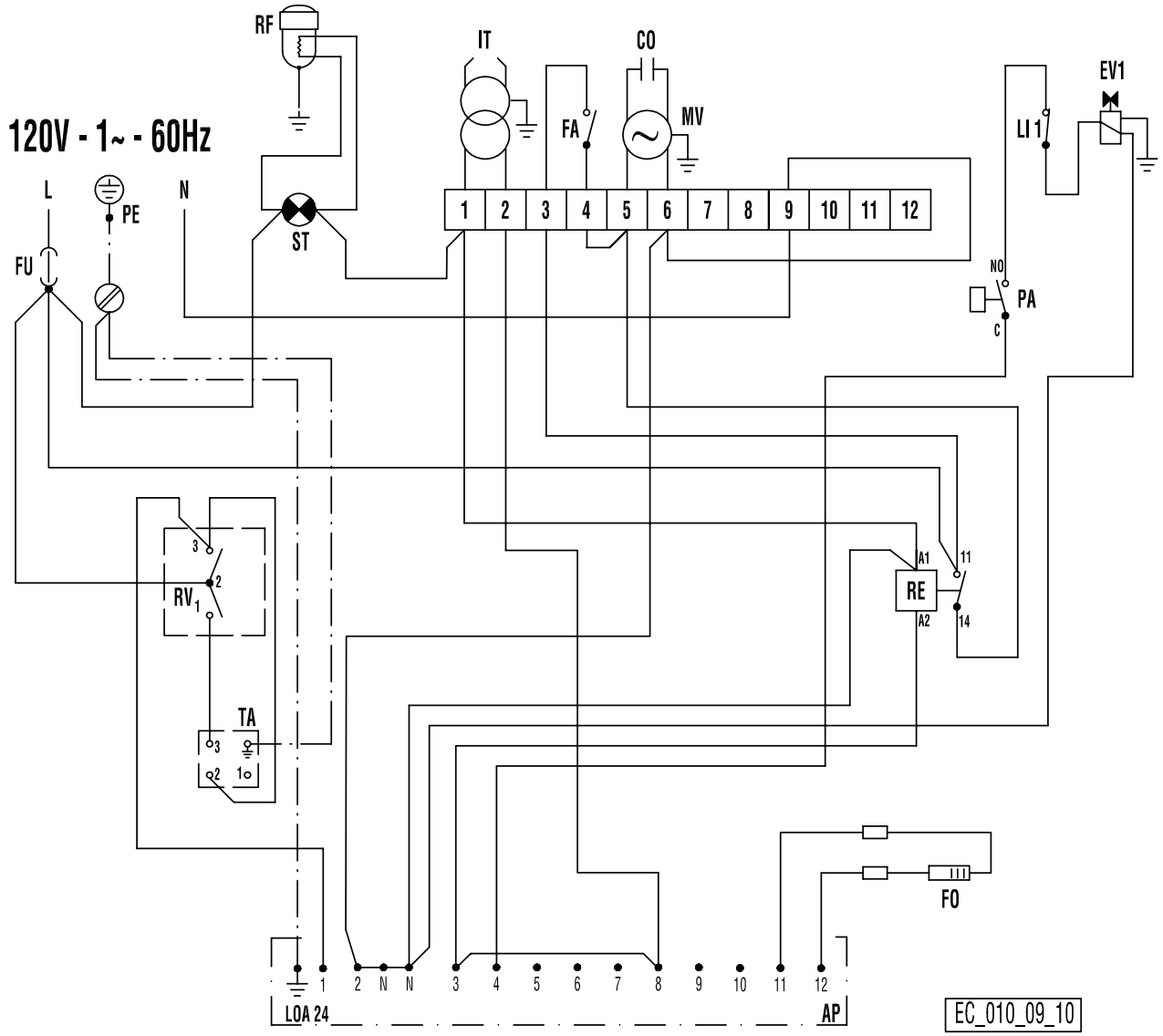
COLUMN INTENTIONALLY LEFT BLANK

TROUBLESHOOTING

TROUBLE	CAUSE	SOLUTION
Motor does not start, no ignition	No electrical current	Check mains (should be 120 V – 1~ – 60 Hz)
		Check proper positioning and functioning of switch
		Check fuse
	Wrong setting of room thermostat or other control	Check correct setting of heater control. If thermostat, make sure selected temperature is higher than room temperature
	Thermostat or other control defective	Replace control device
	Electrical motor defective	Replace electrical motor
	Electrical motor bearings defective	Replace electrical motor bearings
	Burned out condenser	Replace condenser
Motor starts, no ignition or cuts out	Electric ignitor defective	Check connection of H.V. leads to electrodes and transformer
		Check electrodes setting (see scheme "GAP OF ELECTRODES")
		Check electrodes for cleanliness
		Replace H.V. transformer
	Flame control box defective	Replace control box
	Photocell defective	Clean or replace photocell
	Not enough or no fuel at all at burner	Check state of motor-pump plastic coupling
		Check fuel line system including fuel filter for possible leaks
		Clean or replace oil nozzle
	Solenoid defective	Check electrical connection
		Check thermostat LI
		Clean or replace solenoid
Motor starts, heater emits smoke	Not enough combustion air	Make sure air inlet and outlet are free
		Check setting of combustion air flap
		Clean burner disc
	Too much combustion air	Check setting of combustion air flap
	Fuel contaminated or contains water	Drain fuel in tank with clean fuel
		Clean oil filter
	Air leaks in fuel circuit	Check the seals on the ducts and the diesel filter
	Not enough fuel at burner	Check pump pressure
		Clean or replace fuel nozzle
	Too much fuel at burner	Check pump pressure
		Replace nozzle
Heater does not stop	Solenoid	Replace solenoid coil or complete solenoid

If heater still not working properly, please revert to nearest authorized dealer.

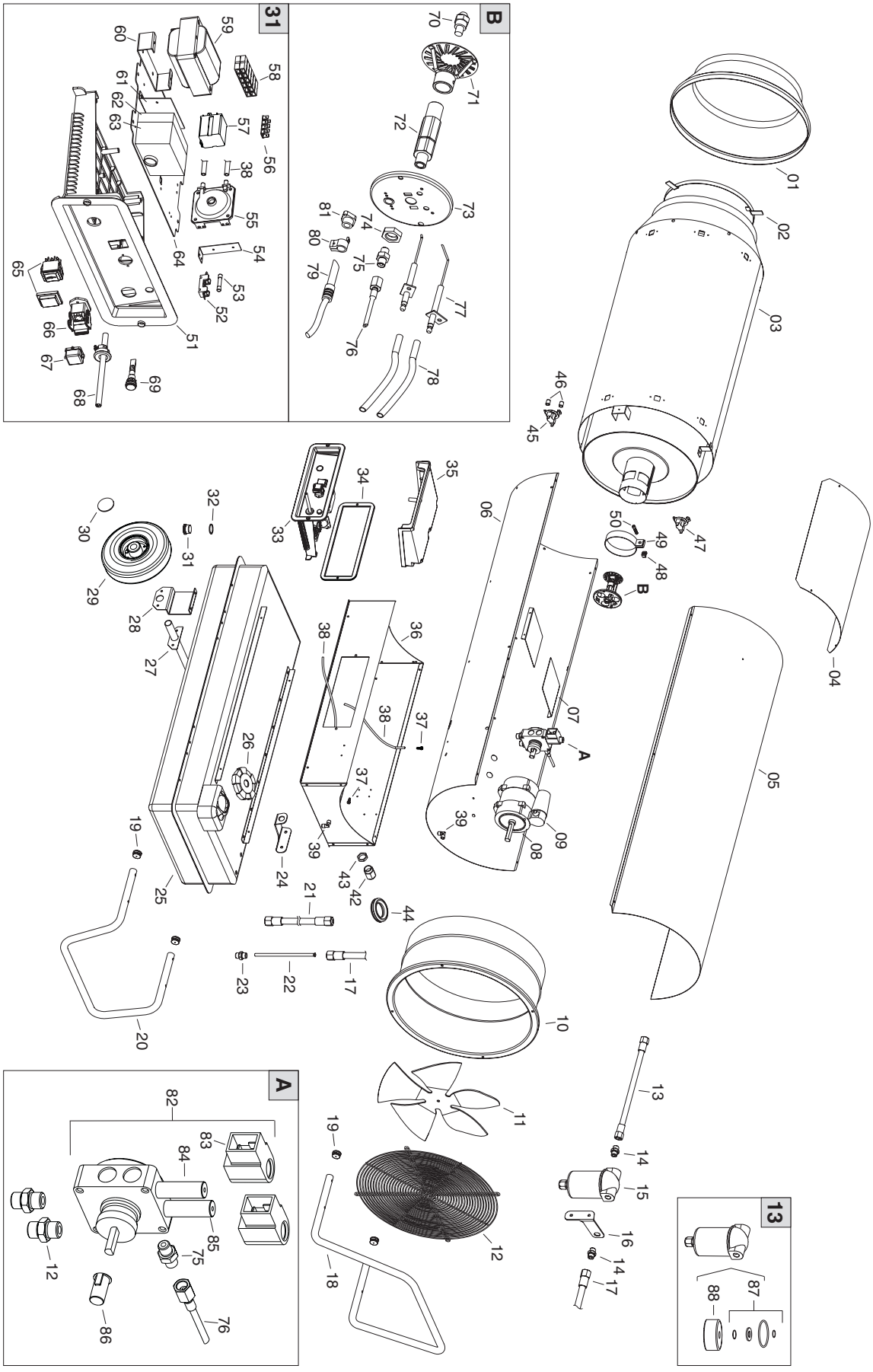
WIRING DIAGRAM
4000 AND 6000 SERIES MODELS



DRAWING LEGEND

FU	Fuse	**RV**	Control
IT	Transformer H.V.	**TA**	Room Thermostat
LI1	Overheat Thermostat	**RE**	Relays
EV1	Solenoid Valve 1°	**AP**	Control Box
FO	Photocell	**PA**	Air pressure control
CO	Condenser	**RF**	Heater filter
MV	Fan Motor	**FA**	Fan thermostat
ST	Electric pilot	**PE**	Ground

4000DF and 6000DF Series Direct-Fired Portable Heater



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HS-MH3500DF, 4000DF-6000DF Portable Heater Parts List BM2

NO.	HS#	BM2 #	3500	4000	6000	DESCRIPTION
01	50027	G06139-9010		*	*	outlet cone
03		G06230	*			combustion chamber
		G06231		*		
		G06232			*	
04	50037	G06143-9010			*	cover protection
05		G06233-9010	*			upper body
		G06234-9010		*		
		G06235-9010			*	
06		G06236-9010	*			lower body
		G06237-9010		*		
		G06238-9010			*	
07		G06240		*	*	air flap
08	50160	E10678-110	*			motor 450W with condenser
	50045	E10679-110		*	*	motor 750W with condenser
09	50161	E11230	*			condenser 40µF
		E11241		*	*	condenser 90µF
10	50163	G06125-9010	*			motor flange
		G06239-9010		*	*	
11	50165	T10260	*			fan blade ø350 18°
	50048	T10215-B		*		fan blade ø496 18°
	50049	T10263			*	fan blade ø500 18°
12	50167	P30169	*			inlet grill
	50050	P30129		*	*	
13	50051	I40330	*	*	*	tube BP 1/4"FF L.420mm
14	50052	I20104	*	*	*	nipple FE 1/4"mm
15		02AC575-1	*	*	*	oil filter pre-heater 1/4"
16	50054	G06104-9005	*	*	*	filter support
17	50055	I40329	*	*	*	tube BP 1/4"FF L.260mm
18	50056	I20176-9005	*	*	*	handle
19	50057	C30319	*	*	*	plug
20	50058	P20177-9005	*	*		foot
	50059	P20180-9005			*	
21	50060	I40331	*	*	*	tube BP 1/4"F L. 580mm
22	50061	I30696	*	*		pick-up tube L. 220mm
	50062	I30698			*	pick-up tube L. 290mm
23	50063	I30737	*	*	*	nipple 1/4"m-m12x1.75m
24	50064	G06068-9005	*	*	*	power lead hook
25	50170	G06127-9005	*			fuel tank 105 liters
	50065	G06128-9005		*		fuel tank 105 liters
		G06146-9005			*	fuel tank 135 liters
26	50070	C30367	*	*	*	fuel cap
27	50067	G06129-9005	*	*	*	wheel axle
28	50068	G06106-9005	*	*		wheel axle support
		G06107-9005			*	
29	50071	C10546	*	*	*	wheel 260-25
30	50072	M20202	*	*	*	spring washer
31	50073	I25019	*	*	*	drain plug
32	50074	C30350	*	*	*	o-ring 30x2.62
33		G00248	*	*		electrical components dwr
		G00251			*	
35	50077	P50127	*	*	*	control box cover
36		G06242-9010	*			base
		G06241-9010		*	*	
42		C30323	*	*	*	cable protection ø10
44		C30372	*	*	*	cable protection ø35
45	50085	E50102	*	*	*	pressure switch

NO.	HS#	BM2 #	3500	4000	6000	DESCRIPTION
46	50086	G06072	*	*	*	sleeve ø8 x ø6 x 9.5
51	50246	G06153	*	*	*	electrial components dwr
52	50093	E20508	*	*	*	fuse holder
53	50092	E10313	*	*	*	fuse (6x30) 20A
56	50096	E20319	*	*	*	terminal board
57	50097	E11125	*	*	*	relay finder 65.31 AC
58	50098	E20305	*	*	*	terminal board
59	50319	E10930	*	*	*	transformer HT BRHAMA
63	50320	E40124	*	*	*	control box BRAHMA
64	50014	G06073	*	*	*	plate for elect. Components
65	50013	E10102-P	*	*	*	switch on-off
66		E20614	*	*	*	thermostat plug 3P+T
67	50011	E20665	*	*	*	thermostat cap
68	50009	E30443	*	*	*	elect. Wire w/plug and fastener
69	50008	E11030	*	*	*	lamp 120V
70	50321	T20357	*	*		nozzle 2.00 GPH 80° W
	50006	T20327			*	nozzle 3.00 GPH 80° W
71	50126	G01077	*	*		turbo disc
		G07025			*	
72		I33005	*	*	*	nozzle support
73		G06228	*	*		burner flange ø 102mm
		G06229			*	
74	50131	I31034	*	*	*	nut M14
76	50133	I40192	*	*	*	micropipe
77	50134	E10215	*	*	*	electrode
78	50322	G02078	*	*		H.T. cables 90° BRAHMA
	50135	G02076			*	H.T. cables 90° COFI
79	50323	E50328	*	*	*	photo cell
82	50324	T20443-1	*			pump Danfoss BFA01-R4
	50139	T20411-1		*	*	pump Danfoss BFP11-R5
83	50140	T20118	*	*	*	solenoid spool Danfoss
84	50141	T20117	*	*	*	solenoid valve Danfoss
85	50195	E10513	*			coupling K1
	50143	E10514		*	*	coupling K2
86	50144	T20241	*	*	*	o-ring kit oil filter
87	50145	T20242	*	*	*	filter cartridge
90	50325	E20418	*	*	*	stop button
91	50336	E50327	*	*	*	photo cell holder
92		G06222-9010	*	*	*	photo cell mounting plate
93	50337	E50441	*	*	*	pressure switch 100Pa
94		I40332	*	*	*	silicone pipe ø4x9
95		I31131	*	*	*	connection straight ø6
96		T20442	*	*	*	solenoid valve cable

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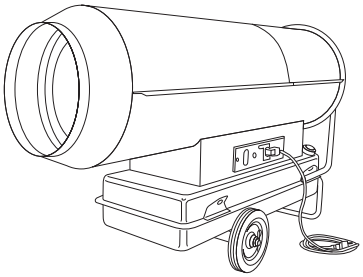

WARNING:

USE ONLY MANUFACTURER'S REPLACEMENT PARTS. USE OF ANY OTHER PARTS COULD CAUSE INJURY OR DEATH. REPLACEMENT PARTS ARE ONLY AVAILABLE DIRECT FROM THE FACTORY AND MUST BE INSTALLED BY A QUALIFIED SERVICE AGENCY.

PARTS ORDERING INFORMATION:

PURCHASING: Accessories may be purchased at any Mr. Heater/HeatStar local dealer or direct from the factory

FOR INFORMATION REGARDING SERVICE

Please call Toll-Free 800-251-0001 • www.enerco-mrheater.com
Our office hours are 8:30 AM – 5:00 PM, EST, Monday through Friday.
Email to: techservice@enerco-mrheater.com
Please include the model number, date of purchase, and description of problem in all communication.

LIMITED WARRANTY

The company warrants this product to be free from imperfections in material or workmanship, under normal and proper use in accordance with instructions of The Company, for a period of one year from the date of delivery to the buyer. The Company, at its option, will repair or replace products returned by the buyer to the factory, transportation prepaid within said one year period and found by the Company to have imperfections in material or workmanship.

If a part is damaged or missing, call our Technical Support Department at 800-251-0001.

Address any Warranty Claims to the Service Department, Enerco Group, Inc., 4560 W. 160TH ST., Cleveland, Ohio 44135. Include your name, address and telephone number and include details concerning the claim. Also, supply us with the purchase date and the name and address of the dealer from whom you purchased our product.

The foregoing is the full extent of the responsibility of the Company. There are no other warranties, express or implied. Specifically there is no warranty of fitness for a particular purpose and there is no warranty of merchantability. In no event shall the Company be liable for delay caused by imperfections, for consequential damages, or for any charges of the expense of any nature incurred without its written consent. The cost of repair or replacement shall be the exclusive remedy for any breach of warranty. There is no warranty against infringement of the like and no implied warranty arising from course of dealing or usage of trade. This warranty will not apply to any product which has been repaired or altered outside of the factory in any respect which in our judgment affects its condition or operation.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Enerco Group, Inc. reserves the right to make changes at any time, without notice or obligation, in colors, specifications, accessories, materials and models.

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